



Figure 1. Photo of AD202KYATI

### FEATURES

- Isolated Power Outputs
- Small Size: 4 Channels/Inch Low
- Uncommitted Input Amplifier
- High CMR: 130dB (Gain = 100V/V)
- High Accuracy:  $\pm 0.2\%$  Max Nonlinearity
- High CMV Isolation:  $\pm 2000\text{V}$  Continuous

### APPLICATIONS

It can be applied for multichannel data acquisition, current shunt measurements motor controls, process signal isolation, high voltage instrumentation amplifier, etc.

### DESCRIPTION

**Upgraded Drop-in Replacement for AD202KY**

**We guarantee production for  $\geq 10$  years.**

The AD202KYATI is a high voltage isolation amplifier designed for multiple applications where input signals are measured, processed, or transmitted without a galvanic connection. These isolation amplifiers in SIP package offer a signal and power isolation function.

With internal transformer-coupling, the AD202KYATI provides total galvanic isolation between the input and output stages of the isolation amplifier. These amplifiers eliminate the need for an external DC-DC converter, which allows the designer to minimize the necessary circuit overhead, thus reducing the overall design and component costs.

The AD202KYATI is powered directly from a 15V DC power supply, featuring small size, high accuracy, low power, wide bandwidth, excellent performance, flexible input, isolated power, etc.

### INSIDE THE AD202KYATI

The AD202KYATI uses an amplitude modulation technique to permit transformer coupling of signals down to dc (Figure 2). It also contains an uncommitted input op amp and a power transformer that provides isolated power to the op amp, the modulator, and any external load. The power transformer primary is driven by a 20kHz, 15V<sub>P-P</sub> square wave generated internally.

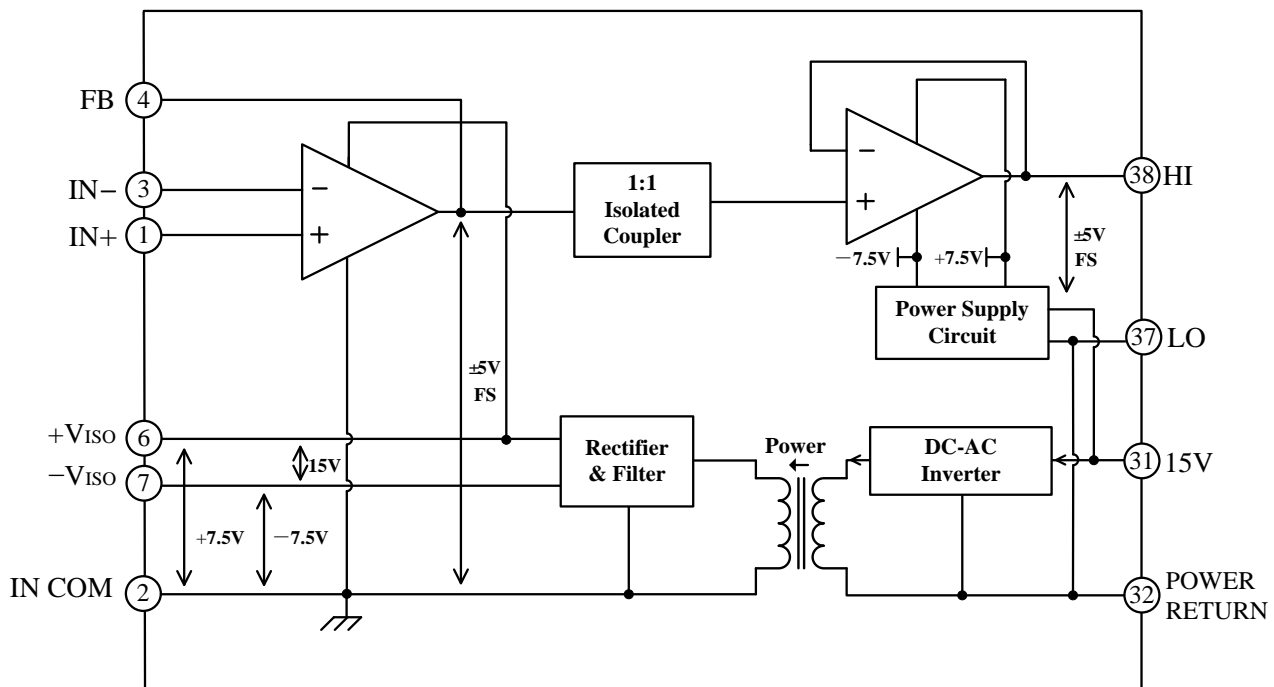


Figure 2. AD202KYATI Functional Block Diagram



#### SPECIFICATIONS

Table 1. Electrical characteristics. (Typical @ 25 °C and  $V_S = 15V$  unless otherwise noted.)

Model	AT202KY
<b>GAIN</b>	
Range	1V/V–100 V/V
Error	$\pm 0.5\%$ typ ( $\pm 4\%$ max)
vs. Temperature	$\pm 20\text{ppm}/^\circ\text{C}$ typ ( $\pm 45\text{ppm}/^\circ\text{C}$ max)
vs. Time	$\pm 50\text{ppm}/1000\text{Hours}$
vs. Supply Voltage	$\pm 0.01\%/V$
Nonlinearity (G = 1V/V)	$\pm 0.01$ max
Nonlinearity vs. Isolated Supply Load	$\pm 0.0015\%/mA$
<b>INPUT VOLTAGE RATINGS</b>	
Input Voltage Range	$\pm 5V$
Max Isolation Voltage (Input to Output)	
AC, 60Hz, Continuous	1500Vms
Continuous (AC and DC)	$\pm 2000V$ Peak
CMRR (Common-Mode Rejection Ratio)*	-74dB
CMTC (Common-Mode Transfer Coefficient)*	$-0.2 \times 10^3$
RS $\leq 100\Omega$ (HI and LO Inputs) G = 1V/V	105dB
G = 100V/V	130dB
RS $\leq 1\text{k}\Omega$ (Input HI, LO, or Both) G = 1V/V	100dB min
G = 100V/V	110dB min
Leakage Current Input to Output @ 240Vrms, 60 Hz	2 $\mu\text{A}$ rms max
<b>INPUT IMPEDANCE</b>	
Differential (G = 1V/V)	$10^{12}\Omega$
Common-Mode	$2G\Omega/4.5pF$
<b>INPUT BIAS CURRENT</b>	
Initial, @ 25 °C	$\pm 30pA$
vs. Temperature (0 °C to 70 °C)	$\pm 10nA$
<b>INPUT DIFFERENCE CURRENT</b>	
Initial, @ 25 °C	$\pm 5pA$
vs. Temperature (0 °C to 70 °C)	$\pm 2nA$
<b>INPUT NOISE</b>	
Voltage, 0.1Hz to 10Hz	1.8 $\mu V_{P-P}$
f > 100Hz	10.8nV/ $\sqrt{Hz}$
<b>FREQUENCY RESPONSE</b>	
Bandwidth ( $V_O \leq 10V_{P-P}$ , G = 1V–50V/V)	20kHz
Settling Time, to $\pm 10mV$ (10V Step)	1ms
<b>OFFSET VOLTAGE (RTI)</b>	
Initial, @ 25 °C Adjustable to Zero	( $\pm 5 \pm 5/G$ )mV max
vs. Temperature (0 °C to 70 °C)	$[\pm 10 \pm \frac{10}{G}] \mu V/^\circ\text{C}$
<b>RATED OUTPUT</b>	
Voltage (Out HI to Out LO)	$\pm 5V$
Output Resistance	7k $\Omega$
Output Ripple, 100kHz Bandwidth	10mV $_{P-P}$
5kHz Bandwidth	0.5mV rms
<b>ISOLATED POWER OUTPUT</b>	
Voltage, No Load	$\pm 7.5V$
Accuracy	$\pm 10\%$
Current	400 $\mu\text{A}$ Total
Regulation, No Load to Full Load	5%
Ripple	100mV $_{P-P}$
<b>POWER SUPPLY</b>	
Voltage, Rated Performance	15V $\pm 5\%$
Voltage, Operating	15V $\pm 10\%$
Current, No Load ( $V_S = 15V$ )	10mA
<b>TEMPERATURE RANGE</b>	
Rated Performance	0 °C to 70 °C
Operating	-40 °C to +85 °C
Storage	-40 °C to +85 °C
<b>PACKAGE DIMENSIONS</b>	
DIP Package (N)	2.10" $\times$ 0.700" $\times$ 0.350"

\*Test Schematic Figure 3 @ 100Hz Sine Wave @  $v_s(t) = 1000V$ .

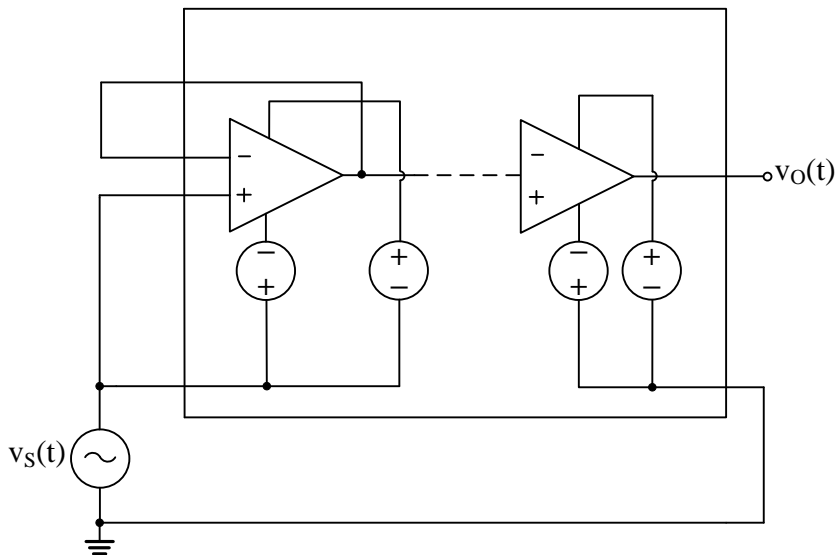


Figure 3. CMRR & CMTC Test Schematic

**PIN DESIGNATIONS**

Block	Pin #	Pin Name	Type	Function Description
Isolated Block	1	IN+	Isolated analog input	Isolated positive (Non-inverting) input
	2	IN COM	Isolated analog ground	Isolated ground
	3	IN-	Isolated analog input	Isolated negative (inverting) input
	6	+VISO OUT	Isolated power output	Isolated positive power supply output, +7.5V, referenced to pin 2 IN COM
	5	-VISO OUT	Isolated power output	Isolated negative power supply output, approximately -7.0V, referenced to pin 2 IN COM
	4	FB	Isolated analog output	Isolated op amp output as a feedback signal
Local Block	37	LO	Analog ground	Output voltage ground reference, internally connected to pin 22 POWER RETURN
	38	HI	Analog output	Op amp output, equals to the voltage difference between FB and IN COM
	31	15 V	Analog input	Positive 15V power supply input
	32	POWER RETURN	Analog input	Power supply return, internally connected to pin 18 GND



MECHANICAL DIMENSIONS

The dimensions of AD202KYATI in SIP package are shown in Figure 4.

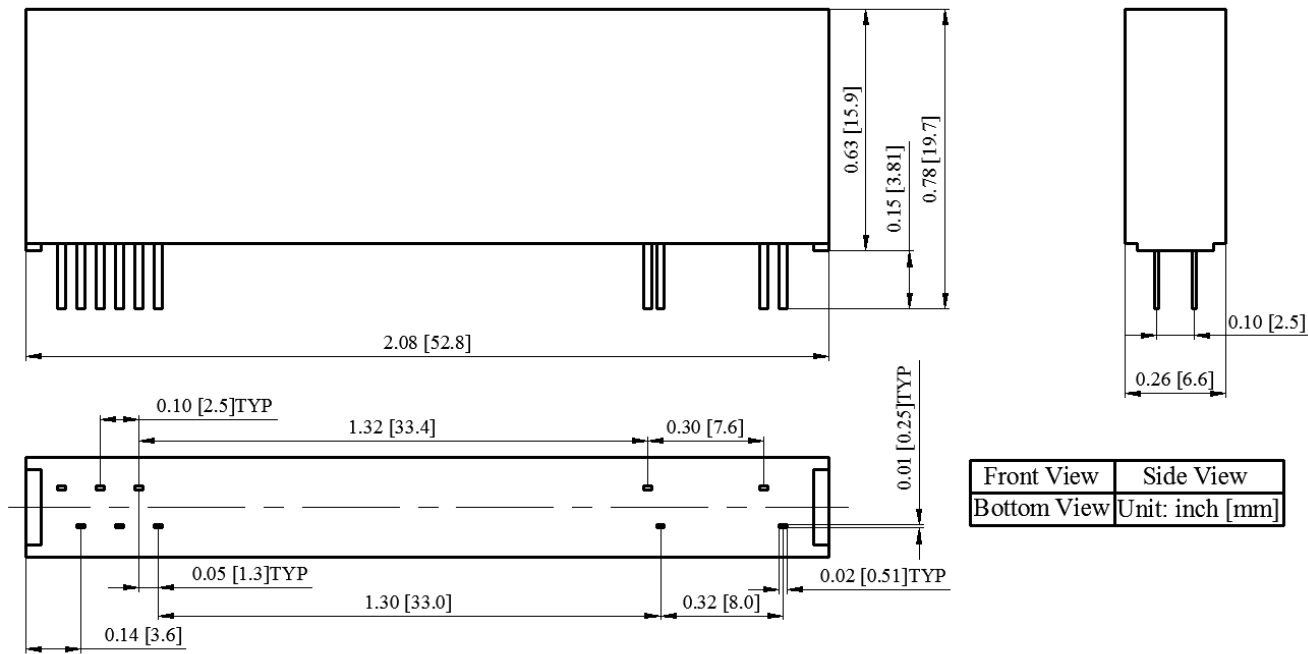


Figure 4. Dimensions of AD202KYATI SIP Package



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